Decision-making in Positive and Negative Prospects: Influence of Certainty and Affectivity

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Abstract

This study examines (a) whether the individuals are risk averse in positive prospects and risk seekers in negative prospects and (b) whether certainty and affectivity determine the choices in prospects. Four hundred undergraduate and graduate students of the Indian Institute of Technology Kharagpur participated in this study. Standard questions were used to assess the responses to prospects, certainty in choice, and the positive and negative affectivity. Findings suggest that in positive prospects, individuals are risk averse with the availability of a certain option and risk seekers with availability of two uncertain options of nearly equal value. In contrast to the preference for gain in positive prospects, individuals prefer to avoid loss and are risk seekers in negative prospects. They express more confidence in choices preferred by the majority. The interactive effects of certainty and affectivity determine choices. Certainty interacting with low positive affectivity influenced the decision in two problems and high certainty interacting with high negative affectivity influenced the decision in six problems. While certainty indicating information possession and processing is a consistent predictor of choices, neither affectivity nor the interaction of affectivity with certainty do so.

Keywords

Decision-making; Certainty; Information Processing; Negative Affectivity; Positive Affectivity

Introduction

The paper aims to examine the choice of individuals in certain and uncertain options and both uncertain options in gain and loss domains. It also tests whether certainty and affectivity influence the individuals' decision.

The maximization of expected utility as a guide to understanding decision behavior was first suggested by Bernnoulli (1986) after observing that individuals did not value risky prospects at their expected values. Von Neumann and Morgenstern (1947) provided an axiomatization of Bernoullian utility theory. Accordingly, individuals choose an alternative in a decision task with highest expected utility. The relevant attributes of the utility function are monetary gain and losses. The utility of a choice is the probability multiplied by the monetary value, summated over all options. In the domain of losses, people are averse to risk that shows concave utility function (Friedman & Savage, 1948). Prospects are judgments in terms of their probability distributions over gain and losses (Von Neumann & Morgenstern, 1947). Kahneman and Tversky (1979) proposed an alternative theory, called 'prospect theory (PT)' that includes empirically observed tendencies. People generally do not weigh the utility of outcomes by their respective probabilities as assumed in expected utility theory. Instead a tendency exists to overweigh certain outcomes, relative to those that are uncertain. This tendency is referred to as the certainty effect. When a choice between two positive prospects (only gains) is compared with its mirror image choice between the two corresponding negative prospects (only losses), individuals typically reverse their preferences. This phenomenon is called 'reflection effect'. To simplify, in risky decision making, people typically disregard common components between alternatives, focusing instead on elements that distinguish the alternatives. This tendency is termed as the 'isolation affect'.

All the foregoing phenomena are inconsistent with what would be predicated by traditional utility theory. To explain these and other tendencies, Tversky and Khaneman (1992) formulated the PT that differs from the expected utility theory. Unlike the utility theory, which is unique up-to positive linear transformations, PT defines a value function on ratio scale (i.e., unique up-to positive ratio transformations). Furthermore, this value function does not measure attitudes toward risk but only the value of outcomes under conditions of certainty. Instead of the objective probabilities used in expected utility theory, PT utilizes decision weights

that reflect the outcomes. Low probabilities are over weighted and high ones generally are underweighted. Individuals prefer certain options in positive prospects and uncertain (risky) options in negative prospects.

PT treats choice situations involving pure risk differently from those involving speculative risk in which gains and losses are combined. Finally, the value function in PT measures the subjective value of outcomes relative to some references point that may vary as a function of problem presentation. The emphasis is on changes in wealth or assets, not on final asset positions as the utility theory. These findings warrant investigation in a different cultural context, different sample, and a different time period to repose the confidence of researchers in earlier findings. Based on above discussion, the following hypothesis is formulated:

> **H_1**: Most individuals will prefer risk aversion in positive prospects (certainty, isolation and reflection effects) and risk seeking in negative prospects.

The information processing theory mentions that the individual faced with a stimulus situation searches for information in order to reduce the uncertainty of the stimulus situation (Fowler, 1965). Otherwise, increase in certainty of the stimulus situation depends upon the availability of information. The extreme choices and the shift in choices on risky and cautious situations following group discussion and social comparison of choices in groups are found to be positively associated with certainty and shift in certainty respectively (Suar, 1992). This suggests that the extent of certainty/confidence in a choice varies directly with the extent of information in favor of that choice. Evidence affirms that people feeling uncertain about choices process information more systematically than those who constantly feel certain (Weary & Jacobson, 1997). Those individuals tend to process information more systematically because they do not possess adequate information in favor of their choices (Edwards et al., 2000).

The extent of certainty and confidence is the introspective conviction regarding the rightness of preferences based on information. Because the feeling of certainty is an internal cue that one is already correct and accurate, it may also suggest that further processing is not necessary. We extend this reasoning and suggest that any choice behavior associated with the feeling of certainty suggests more information possession and processing and that any choice associated with the feeling of uncertainty suggests less information possession and processing. Based on above discussion, we proposed the following hypothesis:

> **H_2**: The more the possession and processing of information in favor of choices are, the more will be the certainty in those choices.

Several lines of research suggest that a decision maker's moods can influence risk-taking. It has been found that when the probability of winning is low, individuals in the happy mood bet less and when the probability of winning is high, they bet more (Isen & Patrick, 1983). When the stacks are high, subjects in happy mood set higher probability levels for winning as the minimum necessary for accepting a bet; and for lower stacks, they set lower probability levels. The influence of moods on risk-taking behavior suggests the direct positive affect on cognitive information processing (Isen & Daubman, 1984). People experiencing positive moods tend to recall positive words, personal experiences, and events. The reverse is true when people are in negative moods (Anderson, 1974; Bower, 1981; Isen & Daubman, 1984). Such literature suggests that people experiencing positive affect try to protect and maintain their positive state (Isen & Simmonds, 1978) and attempt to avoid substantial losses (Arkes et al., 1988). Positive affect promotes positive evaluations and so do negative affect on negative evaluations (Forgas & Bower, 1990; Forgas, Bower & Moylan, 1990). According to this view, the decision maker's response to risk stimuli depends on the gamble's stacks: when the stacks are high, subjects in positive mood are more risk averse in order to avoid the large loss and when confronted low risk stacks, they seek risk so that they can benefit from the gain without putting too much on the line. Mood captures the day-to-day feelings that people experience and is not focused on any particular object, event, individual, or behavior (Gasper, 2004; Isbell, 2004). Affect can be measured as a trait or a state (Watson, Clark, & Tellegan, 1988). In trait form, affect is more stable and can be positive affectivity (PA) and negative affectivity (NA). The same can be used in state taxonomy but a person's state fluctuates regularly, capturing how people feel from moment to moment, hour to hour, and day to day. Transferring the mood states to traits, the following hypothesis is formulated:

> **H_3**: Higher positive affectivity will promote risk aversion and higher negative affectivity will

promote risk seeking in decision-making.

Researchers have pleaded that certainty and affectivity effect information processing. Research has generally demonstrated that high positive affectivity leads to heuristic processing. On the other hand, those people having negative and neutral affectivity search for quality of arguments and appear to elaborate and process information more systematically than those having positive affectivity (Bless et al., 1996; Mackie & Worth, 1989; Schwarz & Bless, 1991). High negative affectivity and more certainty will decide the extent of choice. In other words, we intend to examine whether high levels of certainty and negative affectivity jointly associated with information processing that determine the choice under uncertainty. On the basis of above discussion, the following hypothesis is proposed:

H4: More the negative (positive) affectivity and certainty in the choice will increase (decrease) more information processing to determine the choice.

Method

Participants

Four hundred (Male =310, Female =90) undergraduate and post graduate students from engineering and the management streams of Indian Institute of Technology Kharagpur, West Bengal (India) participated in the study. With the prior permission of the concerned teacher, in each class of about 40 students, the researcher presented briefly the purpose of the study and got the informed content from participants. Those who signed the informed consent and agreed to participate, they were given the questionnaire during the class hour to fill-up and return the questionnaire to the researcher. The participants took about 40 min to complete the questionnaire.

The socio-demographic profiles of male and female students were compared suing *F* test and their gender composition and birth place were compared using χ^2 test. More number of male students participated in the study compared to the female students because of high enrollment ratio (>.80) of male students in engineering and management education. Most of the boys were the natives from urban areas and the girls from semi-urban areas. Very few male as well as female students were from rural areas.

The female students were slightly older than their male counterparts and had studied more years in formal educational institutions than male students. Of the total, 79.5% of the students had no job experience and the reaming students had maximum up to four years of experience. Both male and female students were predominantly from nuclear family having minimum 1 to maximum 5 members and few were from joint/extended families. The average annual income of parents and family members of male and female students did not differ. On the average, the annual income varied from as low as 5,000 to as high as 65 lac Indian rupees (TABLE 1).

Measures

Along with the socio-demographic information on gender, formal education, job experiences, family size, and family income, data were collected using questionnaire on the choice under uncertainty, the extent of certainty on choice, and the positive and negative affectivity.

TABLE 1 SAMPLE PROFILE

Characteristic	Descriptive statistics	Male	Female	χ^2	*F*
Gender	*N (%)*	310 (77.50)	90 (22.50)	121.00***	
Birth Place					
Urban	*N (%)*	168(54.20)	38(42.2)	13.42***	
Semi-urban		86(27.70)	43(47.80)		
Rural		56(18.10)	9(10.00)		
Age	*M (SD)*	20.81(4.50)	23.61(3.97)		28.34***
Years studied		14.99(3.06)	17.73(3.52)		52.11***
Job experience		0.64(2.81)	1.02(1.93)		1.45
Family size		4.67(1.85)	4.69(1.34)		0.01
Income (in INR)		466399(7714.48)	530888(9886.21)		0.42

INR= Indian rupees,

*p<0.05.**p<0.01.***p<0.001.

The questions with options were as follows:

1. Positive prospect **(**Kahneman &Tversky, 1976)	
A: You can win Rs. 25,000 with probability .33 Rs. 24,000 with probability .66 0 with probability .01	**B**: You can win Rs. 20,000 with certainty
2. Positive prospect (Kahneman & Tversky, 1976)	
A: You can win Rs. 25,000 with probability .33 0 with probability .67	**B**: You can win Rs. 24,000 with probabilities .34 0 with probability .66
3. Positive prospect (Kahneman & Tversky, 1976)	
Assume yourself richer by Rs. 30,000 then you are today. You have to choose between	
A:A sure gain of Rs. 1000	**B:** 50% chance to gain Rs. 2000 50% chance to gain nothing
4. Negative prospect (Kahneman&Tversky, 1976)	
A: You can lose Rs. 40,000 with probability .80 0 with probability .20	**B**: You can lose Rs. 30,000 with certainty
5. Negative prospect (Kahneman & Tversky, 1976)	
A: You can lose Rs. 40,000 with probability .20	**B**: You can lose Rs. 30,000 with probability .25
6. Negative prospect (Kahneman & Tversky, 1976)	
A: You can lose Rs. 30,000 with probability .002	**B**: You can lose Rs. 60,000 with probability .001
7. Lottery situation (Kahneman & Tversky, 1976)	
Consider the following two lotteries, described by the percentage of marbles of different colors in each box and the amount of money you win or lose depending on the color of a randomly drawn marble. Which lottery do you prefer?	
A: 90% white Rs. 0	6% red win Rs. 4500	1% green win Rs. 3000	1%blue loss Rs. 1500	2% yellow lose Rs. 1500
B: 90% white Rs. 0	6% red win Rs. 4500	1% green win Rs. 4500	1%blue loss Rs. 1000	2% yellow lose Rs. 1500
8. Lottery situation (Kahneman & Tversky, 1976) Which lotteries do you prefer?				
A: 90% white Rs. 0	6% red win Rs. 4500	1% green win Rs. 3000	3% yellow lose Rs. 1500	
B: 90% white Rs. 0	7% red win Rs. 4500	1% green lose Rs. 1000	2% yellow lose Rs. 1500	
9. Health situation (Kahneman & Tversky, 1976) In the treatment of tumors there is sometimes a choice between two types of therapies: (i) a radical treatment such as extensive surgery, which involves some risk of imminent death, (ii) a moderate treatment, such as limited surgery or radiation therapy. Each of the following problems describes the possible outcome of two alternative treatments, for three different cases. In considering each case, suppose the patient is a 40-year-old male. Assume that without treatment death is imminent (within a month) and that only one of the treatments can be applied. Please indicate the treatment you would prefer in each case.				
Case 1				
Treatment A: 20% chance of imminent death and 80% chance of normal life, with an expected longevity of 30 years.	**Treatment B**: certainty of normal life, with an expected longevity of 18 years.			
Case 2				
Treatment A: 80% chance of imminent death and 20% chance of normal life, with an expected longevity of 30 years.	**Treatment B**: 75% chance of imminent death and 25% chance of normal life, with an expected longevity of 18 years.			
Case 3				
Consider a new case where there is a 25% chance that the tumor is treatable and a 75% chance that it is not. If the tumor is not treatable, death is imminent. If the tumor is treatable, the outcomes of the treatment are as follows:				
Treatment A: 20% chance of imminent death and 80% chance of normal life, with an expected longevity of 30 years.	**Treatment B**: Certainty of normal life, with an expected longevity of 18 years			
10. Health situation(Kahneman & Tversky, 1976) Consider the following two frames (survival and mortality). In each frame two alternative treatments are there. Please indicate the frame as well as treatment you would prefer.				
Survival frame				
Surgery (A): Of 100 people having surgery 90 live through the post-operative period, 58 are alive at the end of the first year and 32 are alive at the end of five years.	**Radiation Therapy (B)**: Of 100 people having radiation therapy all live through the treatment, 77 are alive at the end of one year and 23 are alive at the end of five years.			
Mortality frame				
Surgery (A): Of 100 people having surgery 10 die during surgery of the post-operative period, 30 die by the end of the first year and 60 die by the end of five years.	**Radiation Therapy (B)**: Of 100 people having radiation therapy, none die during treatment, 22 die by the end of one year and 78 die by the end of five years.			

Choice under Uncertainty

There were ten questions in the questionnaire to assess the choice under uncertainty. It contained three positive and three negative hypothetical prospects, two lottery situations associated with probability, and two health risk situations. Each situation had two alternatives, A and B. Students were asked to choose an alternative in each situation indicating their preference. The situations were put in different orders in four different sets of questionnaire.

Certainty in Choice

After choosing an option against each situation, participants reported their level of confidence on the choice. Confidence was measured in the pattern as earlier (Suar, 1992). On each situation, respondents were asked to report: how sure you are to your response to this situation? The response descriptions were given on a four-point unidirectional scale ranging from 'not sure at all (score =1)' to 'very sure (score =4)'. The higher the score was, the more was the confidence on the choice.

Positive Affectivity and Negative Affectivity Schedule

The schedule contained 10 positive and 10 negative words expressing feelings (Watson & Pennebaker, 1989; Watson, Clark & Tellegen, 1988). The items portraying positive affects were: interested, alert, attentive, excited, enthusiastic, inspired, proud, determined, strong, and active and the items portraying negative affects were: distressed, upset, guilty, ashamed, hostile, irritable, nervous, jittery, scared, and afraid. Participants were asked to encircle the replies applied to them. The replies against each item were on a five-point unidirectional scale ranging from 'not at all (=1)' to 'extremely (=5)'. When the convergent validity of items was examined on the current sample using confirmatory factor analysis, all items of positive affectivity loaded very significantly on a single factor and the unstandardized regression weights varied from as low as 1.00 to as high as 2.09, $p<.001$. The one-factor solution had appreciable fit indices (χ^2/df = 3.91, GFI= 0.94, CFI = 0.91, NFI= 0.89, RMSEA = 0.08) and the Cronbach alpha of the items was 0.82. Higher additive score on all items indicated high positive affectivity. Similarly, all items of negative affectivity loaded significantly on one factor and the unstandardized regression weights ranged from 0.77, $p<.003$ to 1.542, $p<.001$ with acceptable fit indices (χ^2/df = 2.18, GFI= 0.96, CFI = 0.90, NFI= 0.70, RMSEA = 0.05). The estimated inter-item consistency using Cronbach alpha was 0.62. Higher additive score on all items indicated high negative affectivity.

Results

Choice under Uncertainty

Chi-square indicated the preference of one choice over the other in each of the positive and negative prospects and *F* statistics compared the level of certainty in each choice (TABLE 2). In positive prospects of gain domains, 58.8 per cent of the subjects had chosen option B in the first problem, 59.2 per cent of the subjects preferred option A in the second problem, and 63.2 per cent of the subjects had chosen option A in the third problem that were different from the rest of subjects who had chosen the other option. When the uncertain option had near or equal stake like the certain option, subjects predominantly preferred the certain options as evidenced in the first and third problems. When both the uncertain prospects had nearly equal value, subjects preferred the higher stake with little lower probability as in the second problem (TABLE 2). These results suggested that in the positive prospects, risk aversion occurred with the availability of a certain option, little more risk-taking with availability of two uncertain options of nearly equal value.

In negative prospects of loss domains, 76.5 per cent of the subjects had chosen the option A in problem 4,66.8 per cent of the subjects preferred the option B in problem 5, and 61 per cent preferred the option A in problem 6 that were significantly different from those who had chosen the other option. Subjects preferred to lose a little more with higher probability than a comparable definite loss in problem 4 and favored little less loss with little more probabilities in problem 5. With extreme low probability of comparable choices, subjects chose the loss with lesser stake in problem 6. In the domain of loss, subjects took the risk with the possibility of avoiding certain loss. When comparable loss was eminent in both the choices, majority preferred the choice with higher stake and with higher probability.

In problem 7 having lottery situations, it was observed that 78.2 percent of the subjects preferred the option B and the rest option A because the gain was more and the loss was less in the former option compared to the latter option. The problem 8 is similar to problem 7 and findings were similar too. Irrespective of probability, subjects had chosen the option that had higher gains.

The three cases of the problem 9 in treatment of tumors, same pattern of preferences was observed. In a radiation treatment of case 1, most participants made a risk averse choice in favor of certain survival with reduced longevity. As the moderate treatment of case 2 that no longer ensured survival, most respondents preferred the treatment that offered the higher expected longevity. However, the difference did not approach the conventional level of statistical significance. In case 3, when certainty of normal life was there with lesser years of longevity compared to 80 per cent normal life with more years of longevity, the former was chosen compared to the latter. In particular, 67.2 per cent of participants had chosen B in case 1, 54.5 per cent selected choice A in case 2, and 63.8 per cent preferred choice B in case 3. The certainty of normal life even with less years of survival scored over the possibility of normal life with more years of survival. When both the choices were nearly probable, more years of expected longevity mattered.

Problem 10 consisted of survival and mortality frame, each treated with surgery and radiation therapy. In both the cases, radiation therapy was preferred over surgery for treatment, i.e. 61.8 per cent preferred radiation therapy in survival frame and 70.8 per cent in mortality frame. Radiation therapy evidently reduced immediate risk of death and post-therapy death within a year compared with surgery.

These findings in all the problems supported the first hypothesis that individuals in positive prospects avoided the risk with the availability of certain option and in negative prospects they took risk with the possibility of avoiding loss.

Certainty in Choices

Whatever option majority of the participants had chosen in each problem, the introspective conviction was more in that option. This pattern was similar across all the 13 problems barring six problems where the value did not reach the level of statistical significance. This indicated that in the majority preferred option in a problem, more information was possessed compare to the other option (TABLE 2) and therefore, individuals had more certainty in the former than that the latter. These findings provided partial support to the second hypothesis that in majority preferred choices, those possessed or processed more information were in favor of the choices.

TABLE 2 CHOICES IN DIFFERENT PROSPECTS AND CERTAINTY IN THE CHOICES

Problem	Option	Preferences (%)	χ^2	Certainty *M* (*SD*)	*F*	PA[a] *M* (*SD*)	*F*	NA[a] *M* (*SD*)	*F*
Problem 1	A	165(41.2)	12.25***	3.11(.73)	193.48***	36.24(6.55)	0.96	13.13(2.15)	0.34
	B	235(58.8)		3.87(.35)		36.88(6.39)		13.00(2.41)	
Problem 2	A	237(59.2)	13.69***	3.26(.78)	0.18	36.82(6.73)	0.62	13.10(2.37)	0.30
	B	163(40.8)		3.23(.72)		36.30(6.05)		12.97(2.22)	
Problem 3	A	253(63.2)	28.09***	3.71(.55)	30.21***	37.25(6.19)	6.80**	12.97(2.40)	0.74
	B	147(36.8)		3.34(.80)		35.51(6.77)		13.18(2.16)	
Problem 4	A	306(76.5)	112.36***	3.25(.79)	11.76**	36.83(6.30)	1.53	13.00(2.30)	0.35
	B	94(23.5)		2.92(.89)		35.90(6.94)		13.24(2.38)	
Problem 5	A	133(33.2)	44.89***	3.05(.76)	0.68	37.00(6.73)	0.73	13.21(2.34)	0.93
	B	267(66.8)		3.11(.77)		36.41(6.32)		12.97(2.30)	
Problem 6	A	244(61.0)	19.36***	3.18(.85)	0.25	36.84(6.51)	0.81	13.06(2.38)	0.01
	B	156(39.0)		3.14(.83)		36.25(6.39)		13.03(2.20)	
Problem 7	A	87(21.8)	127.69***	3.11(.76)	60.73***	35.73(6.76)	2.06	13.12(2.22)	0.11
	B	313(78.2)		3.70(.57)		36.85(6.36)		13.03(2.33)	
Problem 8	A	252(63.0)	27.04***	3.57(.67)	0.20	36.94(6.43)	1.77	13.17(2.34)	1.90
	B	148(37.0)		3.60(.56)		36.05(6.50)		12.84(2.24)	
Problem 9	A	131(32.8)	47.61***	3.35(.62)	5.78*	35.79(6.85)	3.16*	12.83(2.13)	1.77
Case1	B	269(67.2)		3.53(.69)		37.01(6.23)		13.15(2.38)	
Problem 9	A	218(54.5)	3.24	3.28(.76)	0.26	36.11(6.49)	2.88*	13.11(2.33)	0.34
Case2	B	182(45.5)		3.32(.77)		37.21(6.39)		12.97(2.28)	
Problem 9	A	145(36.2)	30.25***	3.25(.72)	9.69**	36.71(6.56)	0.05	12.82(2.24)	2.15
Case3	B	255(63.8)		3.47(.66)		36.56(6.41)		13.18(2.34)	
Problem 10	A	153(38.2)	22.09***	3.16(.78)	2.10	36.57(6.35)	0.01	13.00(2.32)	0.39
SF	B	247(61.8)		3.43(.70)		36.63(6.53)		13.10(2.30)	
Problem 10	A	117(29.2)	68.89***	3.26(.72)	11.54**	36.14(6.76)	0.87	12.81(2.10)	1.80
MF	B	283(70.8)		3.37(.68)		36.80(6.33)		13.15(2.38)	

[a]PA= Positive affectivity, NA= Negative affectivity, SF= Survival Frame, MF=Mortality Frame

*p<0.05.**p<0.01.***p<0.001.

TABLE 3 LOGISTIC REGRESSION ON CERTAINTY, AFFECTIVITY AND THEIR INTERACTION PREDICATING THE CHOICE

Problems	Certainty			Positive affectivity			Certainty x Positive affectivity			Negative affectivity			Certainty x Negative affectivity		
	β	OR	95% CI of OR (LL-UL)	β	OR	95% CI of OR (LL-UL)	β	OR	95% CI of OR (LL-UL)	β	OR	95% CI of OR (LL-UL)	β	OR	95% CI of OR (LL-UL)
Problem 1	2.63	13.91	(8.37-23.12)	.10	1.11	(.59-2.09)	-.04	.96	(.42-2.1)	-.19	.82	(.12-5.50)	-.04	1.00	(.42-2.15)
Problem 2	-.04	.95	(.73-1.23)	-.07	.92	(.63-1.37)	-.13	.87	(.45-1.67)	-.12	.88	(.29-2.68)	-.31	.73	(.12-4.46)
Problem 3	-.46	.62	(.47-.82)	-.01	1.00	(.64-1.53)	-.62	.53	(.23-1.20)	.01	1.00	(.30-3.34)	1.81	6.11	(.60-62.03)
Problem 4	.12	1.13	(.85-1.48)	-.24	.78	(.44-1.39)	-.62	1.17	(.57-2.36)	-.72	.48	(.10-2.32)	.52	1.70	(.24-11.59)
Problem 5	-.05	.94	(.74-1.20)	-.08	.91	(.61-1.36)	-.13	.87	(.74-1.20)	-.01	.10	(.33-2.94)	-.03	1.00	(.15-5.99)
Problem 6	-.77	.46	(.33-.64)	-.12	.88	(.57-1.36)	-.46	.62	(.31-1.23)	.12	1.13	(.37-3.46)	.25	1.28	(.17-9.45)
Problem 7	1.15	3.18	(2.21-4.45)	.44	1.55	(.72-3.33)	-.26	.76	(.31-1.88)	-1.13	.32	(.03-3.49)	1.07	2.93	(.19-43.74)
Problem 8	-.35	1.09	(.79-1.51)	-.11	.89	(.59-1.32)	-.22	.80	(.41-1.52)	-.33	.71	(.23-2.16)	-.72	.48	(.07-3.19)
Problem 9 Case 1	.44	1.45	(1.06-1.97)	.44	1.56	(.91-2.66)	-.32	.72	(.37-1.42)	1.42	4.15	(.68-25.19)	-1.01	.36	(.04-2.96)
Problem 9 Case 2	.06	1.06	(.82-1.38)	.22	1.25	(.82-1.90)	.10	1.10	(.59-2.07)	-.27	.76	(.24-2.41)	-.07	.92	(.16-5.23)
Problem 9 Case 3	.51	1.67	(1.67-1.23)	-.24	.78	(.46-1.32)	.20	1.22	(.62-2.37)	1.68	5.36	(1.06-27.14)	-1.15	.32	(.04-2.33)
Problem 10 SF	-.23	1.26	(.95-1.70)	-.03	1.00	(.57-1.62)	-.01	1.0	(.51-1.89)	.66	1.95	(.45-8.31)	-.43	.65	(.10-4.04)
Problem 10 MF	.49	1.64	(1.22-2.19)	.25	1.29	(.72-2.29)	-.27	.76	(.37-1.54)	2.06	7.85	(1.01-61.45)	-1.73	.17	(.01-1.82)

B = Logistic coefficient, OR= Odds ratio, UL=Upper limit, LL=Lower limit, CI=Confidence interval

$p<0.05$.**$p<0.01$.***$p<0.001$.

Affectivity in Choice

The higher the positive affectivity will promote risk aversion and higher negative affectivity will promote risk seeking in decision-making. On only three problems (out of six), the individuals those who were risk averse had higher positive affectivity and in none of the problems, risk seekers had high negative affectivity. Only on risk aversion, did the findings in about 40% of cases supported the third hypothesis.

Certainty and Affectivity Determining the Choice

Logistic regression was carried out to understand the influence of certainty and affectivity on choice behavior. The odds ratios (ORs) of 1 or more than 1 of a choice indicate that a choice has 50% or more than 50% chance of occurring than non-occurring. Barring a few exceptions, as certainty increased, the probability of selecting a choice 0 was 0.50 or more than 0.50 in four out of first six problems, and similar was the probability of selecting choice 1 in rest of the problems. Positive affectivity trait influenced the selection of choices in 7 problems whose ORs were greater than or equal to 1. Decrease in positive affectivity was associated with risk seeking in six problems and increase in positive affectivity was associated with risk aversion. Except in problem no 10 where decrease in positive affectivity was associated with risk aversion. Conversely, increase in negative affectivity was associated with risk seeking in six problems out of 13 and high certainty interacting with low positive affectivity influenced the decision in two problems and high certainty interacting with high positive affectivity influenced the decision in another two problems. Similarly, negative affectivity traits influenced the selection of choices in six problems and high certainty interacting with high negative (positive) affectivity influenced the decision in six (two) problems (TABLE 3). The third and fourth hypotheses are not consistently supported across all problems.

Discussion

This study examines the choice under uncertainty, the certainty in choice, and the affectivity traits that influence the choice. Results suggest that individuals are averse to risk in positive prospects and seeker to risk in negative prospects. Certainty increases in preferred choices of the majority in a prospect. Further, certainty interacting with low positive affectivity influences the decision in two problems and high certainty interacting with high negative affectivity influence the decision in six problems out of 13. While certainty indicating information possession and processing is a consistent predictor of choices, neither affectivity nor the interaction of affectivity with certainty behaves similarly.

The findings support the earlier results (Kahneman &

Tversky, 1979; Parker & Isbell, 2010) that people take risk in negative prospects and avoid risk in positive prospects. Individuals have more preference for gain than that for losses. This has been consistently observed in positive and negative prospects and in isolation effects. In positive prospects, where there is certainty of gain, people prefer the gain with certainty rather than the gain with uncertainty or low probabilities. In negative prospects, majority of individuals prefer risky choices having low probabilities.

Previous findings support that the value function of a prospect is a deviation from the reference point, generally concave for gains and convex for losses and also steeper for losses than that for gains. This S-shaped value function is steepest at the reference point, in marked contrast to the utility function (Kahneman & Tversky, 1979). In the positive prospects, risk aversion occurred with the availability of a certain option, risk-seeking with availability of two uncertain options of nearly equal value. In negative prospects, individuals take the risk for avoiding more losses. Individuals choose the option that has advantage for gains in positive prospects and disadvantage for losses in negative prospects. In other words, individuals are more preferential to gain than that to loss.

Majority of individuals have preferred an option in a prospect based on gain and loss estimation. Where more information is drawn in a favor of choice compared to the other option in a prospect, majority of the individuals are swayed in favor of that choice. When respondents' actual level of confidence is below their desired level of confidence, they will make more effort to process information. The social cognition theory (Tversky & Kahneman, 1991) recognizes the role of uncertainty in a choice as a motivator for engaging in various effortful cognitive processes. Because feeling certain in a choice is an internal cue that one is already correct and accurate, it may also suggest that further processing is not necessary (Mackie & Worth, 1989). Individuals encountering situations in which they are highly certain than the situations in which they are uncertain, which suggests that the former individuals possess more information in favor of a choice than the latter individuals. In accordance with the certainty in choices, majority of individuals are found to possess more information for higher gain in positive prospects and avoidance of higher loss in negative prospects.

Positive affectivity leads to increased reliance on heuristic cues such as the expertise of the source. Contrarily, negative affectivity of respondents is more attuned to the quality of information than positive affectivity of people, and thus appearing to be more elaborate and systematic in information processing in negative affectivity than that in positive affectivity (Bless et al., 1996; Mackie & Worth, 1989; Schwarz, Bless & Buhner, 1991). Positive affectivity associated with certainty results in heuristic processing, and negative affectivity associated with uncertainty results in systematic processing. Accordingly, high certainty interacting with high negative affectivity influenced the decision also in six problems and high certainty interacting with low positive affectivity influenced the decision in two problems. However, neither the affectivity traits nor the interactions between the certainty level and the affectivity traits predict the choice consistently.

Respondents having more certainty and high negative affectivity (low positive affectivity) have the ability to systematically process the information. Previous research has shown that positive affectivity disrupts careful processing because respondents are unable to do systematic processing when the message is directed at them personally (Clore & Huntsinger, 2007). However, results indicate that higher the certainty and lesser the positive affectivity may be the motivational factor for participants to engage in effortful cognitive processing required during decision making under uncertainty. Contrarily, high positive affectivity fosters heuristic processing.

In judging the implications of the study, we have found it necessary to consider separately its implications for different management application. An insurance company may develop a policy having certain gains and less probability of minimum loss, which can mobilize the customers to purchase the policy. Findings that certainty and low positive/high negative affectivity jointly may be the motivational factor that prompts systematic information processing can be of significance in many areas where persuasive communications are applied. Particularly, in the health domain, where persuasive message may be designed to prevent illness, strategies that make individuals more capable of processing information could be exceptionally beneficial.

This study has demonstrated that certainty and negative affectivity of participants influence risk seeking on about half of the hypothetical situations. Therefore, caution must be exercised in generalizing the findings to real world. Because affectivity traits did not consistently relate to risk and conservative choices, experimental studies can be carried out to see the effects of moods on choice behavior and information processing. Excluding from the limitations, this study validates the earlier findings in an Indian sample that people want to gain more, prefer the certain gains against uncertain gains of almost equal value and do not want to lose more in hypothetical prospects. It's further added that choice of the majority in a prospect is associated with more information retrieval, comprehension, and processing; and high certainty in a choice interacting with high negative affectivity trait helps in systematic processing of information that determine a choice.

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